

RECORDS OF BATS FROM COSTA RICA

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ABSTRACT: Twenty-five species of bats from Costa Rica are reported, ten species and one subspecies of which are new records for the country. Information on distribution patterns and ecological observations are included. New to the chiropteran fauna of Costa Rica are: *Saccopteryx leptura*, *Peropteryx macrotis*, *Pteronotus davyi*, *Chilonycteris psilotis*, *Micronycteris schmidtorum*, *Chrotopterus auritus*, *Mesophylla macconnelli*, *Natalus stramineas*, *Myotis sinus*, *Myotis chiloensis* and *Eptesicus furinalis gaumeri*. *Balantiopteryx plicata* is reported from Costa Rica for the first time since the type description, and the separate generic status of *Mesophylla macconnelli* is reaffirmed.

INTRODUCTION

In 1962, the Los Angeles County Museum of Natural History (LACM) was awarded a four-year grant from the U.S. Army Medical Research and Development Command to support a survey of the mammals and mammalian ectoparasites of Costa Rica. The mammals collected during the three years of the field phase of this study, and specimens collected in 1957 (Starrett and De la Torre, 1964), 1959, and 1961 (Casebeer, Linsky and Nelson, 1963, and Tamsitt and Valdivieso, 1961) by various field parties from the University of Southern California and the Los Angeles County Museum of Natural History, have provided this museum with a good representation of the chiropteran fauna of Costa Rica. Using this material as a nucleus, the LACM has been attempting to put together a picture of the distributional patterns of the bats of Costa Rica, with the aid of published records and specimens available in other collections, as well as continued collecting in that country. There are now known from Costa Rica at least 78 species of bats, based on authenticated published records and specimens reported in this paper, and the total number may be expected reasonably to reach 100 as the various collections continually being made by this museum and other institutions are worked up. An increase in interest in Neotropical bat faunas is represented by a number of recent publications which have included records of species from Costa Rica (in addition to those already cited): Carter, Pine and Davis, 1966; Davis, 1965 and 1966; Davis and Carter, 1962; Davis, Carter and Pine, 1964; Nelson, 1965; Walton, 1963. This paper reports on 226 specimens of 25 species of bats, ten species and one subspecies of which are new records for Costa Rica.

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Localities are listed after capitalized province names which are reported in alphabetical order. Elevations have been converted to meters for the sake of uniformity and ease of comparison; (when shown in italics, they represent reasonable estimates, usually based on topographic maps). Measurements are in millimeters and are for adult specimens unless otherwise indicated. Capitalized Forest Formations are those of L. R. Holdridge, from Slud, 1964.

SPECIES OF BATS

Rhynchonycteris naso (Wied-Neuwied)

Vespertilio naso Wied-Neuwied, 1820, Reise nach Brasilien in den Jahren 1815-1817, 1: 251, footnote.

Rhynchonycteris naso, Peters, 1867, Monatsb. preuss. Akad. Wiss., Berlin, p. 478.

Specimens: GUANACASTE: Río Colorado at Hacienda La Norma (Finca Coyolar) 5 km N, 4 km W Liberia, 50 m, 3 ♂♂, 11 ♀♀; 0.8 miles by road SW Tilarán, (Santa Rosa drainage), 500 m, 1 ♂; Río Diria at Santa Cruz, 60 m, 1 ♂, 2 ♀♀; Sámará, sea level, 1 ♂. HEREDIA: 4 miles W Puerto Viejo de Sarapiquí, 92 m, 1 ♀ (TCWC). LIMON: Río Madre de Dios, near Finca La Lola, 50 m, 1 ♂. PUNTARENAS: 6.5 miles N, 2 miles W Puntarenas, 30 m, 1 ♂ (TCWC); Río La Vieja on Interamerican Highway, 110 m, 1 ♀; Boca de Barranca, sea level, 4 ♀♀; 2.8 miles E Golfito, 60 m, 1 ♂; 8 miles ENE Golfito, 30 m, 1 ♀; Rincón de Osa, headquarters area Osa Productos Forestales, 10 m, 1 ♂.

Measurements: Forearm, averages and ranges for 7 males and 12 females, respectively, 35.8 (34.5-37.3), 37.7 (36.3-38.8).

Remarks: Although this bat is known from every Middle American country and most tropical countries in South America (Sanborn, 1937), all previous Costa Rican records are based on 10 specimens, without locality, which were collected by G. K. Cherrie and cited first (as 11 specimens) by J. A. Allen (1897). The 30 specimens recorded here were all collected at low elevations (up to 500 m) and from localities which include both the driest and wettest regions of the country as well as both Pacific and Caribbean lowlands. All of the collecting localities, with the exception of that at Rincón de Osa, are in areas which have been modified ecologically by one type of agricultural use or another; the virgin tropical wet forest of the Rincón area is undergoing change due to investigatory lumber operations. The only immediately apparent ecological preference shown by *Rhynchonycteris* in Costa Rica is for watercourses. The series from Hacienda La Norma was collected during the day from two adjacent colonies hanging from the face of cliffs along the Río Colorado, the larger of the two colonies having an estimated 45 individuals, some of which were females carrying young. All the other LACM specimens were netted or shot over or next to streams or rivers along which they were hunting. They were taken variously in association with *Saccopteryx bilineata*,

Noctilio leporinus, *Noctilio labialis*, *Chilonycteris parnellii*, *Molossus* sp., and various stenodermines which used the watercourses as flyways.

***Saccopteryx leptura* (Schreber)**

Vespertilio lepturus Schreber, 1774, Die Säugethiere, Teil 1, Heft 8, pl. 57 (name); 1775, *ibid.*, Teil 1, Heft 9, pp. 173-174 (description).

Saccopteryx lepturus, Illiger, 1811, Prodromus systematis mammalium et avium, p. 121.

Specimens: GUANACASTE: Playas del Coco, sea level, 1 ♀; Mojal de Santa Cruz, Arenal (Cartajena), 55 m, 6 ♂♂, 2 ♀♀. LIMON: "El Tigre," approximately 14 km S Siquirres, 825 m, 1 ♀. PUNTARENAS: 15 km SE Jaco, Batalla's Finca, Esterillos Oeste, sea level, 1 ♀; 3.8 miles NW Villa Neilly along Interamerican Highway, 55 m, 1 ♀; Rincón de Osa, headquarters area Osa Productos Forestales, 10 m, 1 ♂.

Measurements: Averages and ranges: forearm, 7 males, 5 females, respectively, 38.4 (37.0-39.6), 40.9 (39.8-42.5); (cranial, males and females together) greatest length of skull (6 specimens), 13.5 (13.2-13.8); condylo-canine length (7), 11.8 (11.5-12.3); length of maxillary toothrow, C-M³ (8), 5.2 (4.9-5.6); postorbital constriction (8), 2.2 (2.0-2.6); zygomatic breadth (7), 8.6 (8.5-9.1); mastoid breadth (7), 7.3 (7.1-7.5).

Remarks: This species was known previously in Middle America from Panama (Sanborn, 1937; Handley, 1966), Nicaragua (Davis *et al.*, 1964), El Salvador (Burt and Sturton, 1961) and Chiapas, Mexico (Carter *et al.*, 1966). The 13 specimens included here represent the first records of *S. leptura* from Costa Rica. All were collected at low elevations: the one from "El Tigre" represents the only record from the Caribbean slope and is from the highest elevation (825 m); the others are all from elevations below 60 m on the Pacific lowlands. These specimens were shot at night over roads or clearings or taken during the day from roosting sites in caves (Playas del Coco) or on sheltered areas of tree trunks (Mojal de Santa Cruz).

***Peropteryx macrotis macrotis* (Wagner)**

Emballonura macrotis Wagner, 1843, Arch. Naturgesch., Jahrg. 9, 1; 367.

Peropteryx macrotis macrotis, G. M. Allen, 1935, Jour. Mamm., 16: 227.

Specimens: ALAJUELA: 4 km NE La Palmira, Finca Las Vegas, 400 m, 1 ♀; 8.2 miles W bridge at Atenas on road to San Matéo, 671 m, 1 ♀. LIMON: 1 mile NW Limón, Les Cuevas, sea level, 1 ♂, 2 ♀♀. PUNTARENAS: Boca de Barranca, sea level, 1 ♀; 35 miles SE San Isidro del General along Interamerican Highway, at bridge over Río Ceibo, 320 m, 1 ♀. SAN JOSE: Río Cañas, Las Cuevas, 200 m, 2 ♂♂.

Measurements: Averages and ranges: forearm (3 males, 6 females, respectively), 42.6 (41.9-43.0), 45.4 (43.8-46.9); (cranial, males and females together) greatest length of skull (7 specimens), 14.9 (14.5-15.3); length of

maxillary tooththrow, C-M³ (9), 5.8 (5.5-6.0); postorbital constriction (9), 2.9 (2.7-3.2); zygomatic breadth (9), 8.5 (8.3-8.8).

Remarks: These nine specimens mark the first records of *P. macrotis* for Costa Rica, although the species is known from southern Mexico to and throughout tropical South America (Hall and Kelson, 1959; Sanborn, 1937). The Costa Rican specimens are all from lower elevations and represent both Pacific and Caribbean slopes. They were shot at night over roads in areas where trees (but not necessarily forest) occurred, or were taken from diurnal roosts in caves (Limón, Río Cañas, Finca Las Vegas). Although *P. macrotis* was collected in association with *P. kappleri* in all three of the roosts, the two species were never taken together while feeding over the roads at night. The roosting *Peropteryx* were found in rather open situations at or very near the mouths of the caves.

***Centronycteris maximiliani centralis* Thomas**

Centronycteris centralis Thomas, 1912, Ann. Mag. Nat. Hist., ser. 8, 10: 638.

Centronycteris maximiliani centralis, Sanborn, 1937, Zool. Ser. Field Mus. Nat. Hist., 20: 337.

Specimens: PUNTARENAS: Rincón de Osa, Osa Productos Forestales, Camp Seattle, 35 m, 2 ♀ ♀, and near headquarters area, 10 m, 1 ♀.

Measurements: Forearm (3 females), 42.7, 44.2, 44.4; (cranial, third female) greatest length of skull, 14.4; condylobasal length, 13.2; length of maxillary tooththrow, C-M³, 5.9; postorbital constriction, 3.0; zygomatic breadth, 9.1; breadth across M³-M³, 6.1.

Remarks: This species is known from relatively few localities from southern Mexico to southern Brazil (Hall and Kelson, 1959; Handley, 1966; Sanborn, 1937) and was first recorded from Costa Rica, without definite locality, by Allen and Barbour (1923). The same specimen was later listed by Sanborn (1937) as coming from Viragua, Prov. Alajuela, and then by Goodwin (1946) from Vijagua, Prov. Alajuela. Sanborn's spelling was in error: the label on the specimen (MCZ 7092) reads "Vijagua, Costa Rica," Vijagua being an alternative spelling for Bijagua, or La Bijagua, a small town on the Caribbean slope of Volcán Miravalles, Prov. Alajuela (some 320 km NW of Rincón de Osa).

The rarity of specimens of *C. maximiliani*, in the light of our limited experience with this bat, suggests that it requires relatively heavy forest (possibly virgin stands) in which to live. The very slow and highly maneuverable, floppy flight of this species makes it well adapted to hunting insects among trees and along natural (and now man-made) pathways and clearings. The three specimens reported here were all collected in just such situations.

***Balantiopteryx plicata plicata* Peters**

Balantiopteryx plicata Peters, 1867, Monatsb. preuss. Akad. Wiss., Berlin, p. 476.

B [alantiopteryx] p [licata] plicata, Burt, 1948, Occ. Pap. Mus. Zool., Univ. Mich., No. 515, p. 2.

Specimens: GUANACASTE: Playas del Coco, sea level, 16 ♂♂, 17 ♀♀; Mico de Matapalo, 50 m, 13 ♂♂, 1 ♀.

Measurements: Averages and ranges: forearm (22 males, 10 females, respectively), 40.0 (39.0-42.3), 42.0 (40.2-43.2); (cranial, 2 males, 2 females together) greatest length of skull, 14.4 (14.2-14.6); condylobasal length, 13.0 (12.9-13.1); length of maxillary toothrow, C-M³, 5.4 (5.4); interorbital breadth, 5.5 (5.4-5.5); postorbital constriction, 3.1 (2.9-3.3); zygomatic breadth, 9.1 (8.9-9.2); breadth of braincase, (3 specimens), 6.9 (6.9-7.0); mastoid breadth, 8.1 (7.9-8.1); alveolar breadth across upper canines, 3.6 (3.5-3.7); breadth across M³-M³, 6.6 (6.5-6.6).

Remarks: Since the description of *B. plicata* in 1867, based on one specimen from "Puntarenas in Costa Rica," this bat has been collected from a number of localities, and often in rather large numbers, from tropical Mexico, Guatemala and El Salvador (Hall and Kelson, 1959; Felten, 1955; Burt and Stirton, 1961), but only recently has it been reported from localities further to the south. Jones (1964) includes a single specimen from each of two localities in Nicaragua, and this paper records the first specimens to be taken in Costa Rica since the type description. Hall and Kelson (1959) assume Peters' type locality to be Puntarenas, Prov. Puntarenas, but since the place name is used to refer to both the town and the province and Peters did not specify more than "Puntarenas," the exact type locality must remain open to question. Because most (if not all) of the known specimens of this bat apparently come from localities in the relatively drier portions of Middle America, usually on the Pacific side of the cordillera (all localities in Central America), it is *most likely*, on ecogeographic grounds, that the type of *B. plicata* came from the lowland Tropical Dry Forest region in the small portion of Puntarenas Province north and northwest of Punta Leona (some 10 km south of the Río Grande de Tárcos), if not actually from the town of Puntarenas itself.

Both series of *Balantiopteryx* recorded here came from colonies in diurnal roosts. The specimens from Playas del Coco were roosting in a series of fissures in the face of a sea cliff which was accessible only at low tide; those from Mico de Matapalo were hanging in the shadow of a huge rafter near the mouth of a short, partially collapsed, abandoned manganese mine. The bats taken from the latter colony were all adults (January 26, 1963), while the former series included 18 adults, 14 subadults and one large juvenile (August 27, 1962).

***Diclidurus virgo* Thomas**

Diclidurus virgo Thomas, 1903, Ann. Mag. Nat. Hist., ser. 7, 11: 337.

Specimen: PUNTARENAS: 2.7 miles NW Villa Neilly along Interamerican Highway, at bridge over Río Nuevo, 55 m, 1 ♀.

Measurements: Forearm, 65.0; greatest length of skull (to front of canines), 18.4; condylobasal length, 17.6; length of maxillary toothrow, C-M³,

7.9; interorbital breadth, 8.7; postorbital constriction, 5.6; zygomatic breadth, 12.1; breadth of braincase, 9.2; mastoid breadth, 10.2; alveolar breadth across upper canines, 4.4; breadth across M^3 - M^3 , 8.4.

Remarks: This specimen is apparently the first record from the Costa Rican lowlands for this species, which is known by relatively few records from Oaxaca, Mexico, to western Panama (Hall and Kelson, 1959; Handley, 1966). It has been reported previously from Costa Rica from three localities, all of which are on the Meseta Central (central plateau)—Escazú (type locality), San José and La Palma (all Prov. San José)—at elevations ranging approximately from 1100 to 1500 m (with some leeway, depending on the exact localities represented by the locality names). The Río Nuevo individual was shot at night as it hawked insects over the road, flying relatively high and apparently straight courses, out of the range of the lights of the field truck, and uttering a unique musical twittering not heard in other Costa Rican bats. On the night this bat was collected (September 9, 1963), we had parked the truck by the road and a phenomenal number of moths were swarming in the headlights. Numerous bats were dodging in and out of the headlight beams, snapping up the moths and other insects, and within about an hour (starting at dusk or approximately 6:00 PM local time) we collected a number of *Saccopteryx bilineata* and *Pteronotus suapurensis* as they chased insects in our lights, as well as the *Diclidurus*, which was making passes above the truck. The peculiar musical call of the white bat was heard above us in the dark during most of the time until the specimen was shot, after which the sound was noticeably absent from the night air.

White bats, which were almost certainly *Diclidurus* and not the smaller and undoubtedly less conspicuous *Ectophylla alba*, were mentioned by local people at Boca de Barranca, Prov. Puntarenas (sea level, Pacific lowlands) and Finca La Lola, Prov. Limón (50 m, Caribbean lowlands). In both places they were said to have been seen hanging from beneath the leaves of coco palms during the day. One was shot by one of the men working at Pension Chanita, Boca de Barranca, in 1959 (and thrown away).

Cyttarops alecto Thomas

Cyttarops alecto Thomas, 1913, Ann. Mag. Nat. Hist., ser. 8, 11: 134.

Specimens: HEREDIA: Puerto Viejo de Sarapiquí, 100 m, 3 ♂♂, 5 ♀♀.

Measurements: Forearm (male, 3 females, respectively), 45.8, 47.1, 46.7, 46.6; (cranial, same male, first two females) greatest length of skull, 13.6, —, 14.3; condylobasal length, 12.6, —, 13.1; length of maxillary toothrow, C- M^3 , 5.4, 5.6, 5.5; interorbital breadth, 5.1, —, —; postorbital constriction, 4.2, 3.7, 3.9; zygomatic breadth, 8.7, —, —; breadth of braincase, 7.1, 7.1, 7.1; mastoid breadth, 7.7, —, 7.6; alveolar breadth across upper canines, 3.0, —, —; breadth across M^3 - M^3 , 6.3, —, —; length of mandibular toothrow, C- M^3 , 6.0, 6.0, 5.9.

Remarks: This rare bat was represented only by the type specimen from

Para, Brazil, and a second specimen from British Guiana (also used in the original description) until 1964, when three specimens were recorded from Los Diamantes, Prov. Limón (300 m), with a fuller description of its characters (Starrett and De la Torre, 1964). The eight specimens reported here were collected at a town some 35 km northwest of Los Diamantes and also on the Caribbean lowlands, and constitute the fourth locality record for this monotypic genus. These bats were shot during the day as they hung, in small groups, from beneath the fronds of coco palms in the town of Puerto Viejo, on three successive days (September 15-17, 1964). The series includes one adult male, four adult females, two subadult males and one subadult female (LACM 26614-26617, 26625-26627, 26633). The specimens are in a better state of preservation than those from Los Diamantes (LACM 14572-14574), which were collected from a coco palm by some workers and preserved in local alcohol. The new specimens show color variation in that some of the adults have a somewhat paler gray area in the region of the shoulders and dorsal portion of the base of the neck. In other respects they agree with those from Los Diamantes and with the type description.

Noctilio leporinus mexicanus Goldman

Noctilio leporinus mexicanus Goldman, 1915, Proc. Biol. Soc. Wash., 28: 136.

Specimens: LIMON: Tortuguero, sea level, 1 ♀ (UF 4647). PUNTARENAS: Boca de Barranca, sea level, 1 ♂, 1 ♀; Río Coronado, 20 km NW Puerto Cortés, sea level, 1 ♀; Dominical, sea level, 1 ♀.

Measurements: Forearm (1 male, 3 females, respectively), 82.9, 85.0, 82.0, 83.9; (cranial, male and first female) greatest length of skull, 27.5, 26.1; condylobasal length, 23.9, 23.3; length of maxillary toothrow, C-M³, 10.4, 10.0; postorbital constriction, 7.2, 7.0; zygomatic breadth, 19.2, 18.2; mastoid breadth, 17.8, 16.4; breadth across M³-M³, 12.5, 12.3.

Remarks: Although this fish-eating bat ranges throughout most of the Neotropics (Cabrera, 1957; Hall and Kelson, 1959) and has been known from Panama since 1923 (Allen and Barbour, 1923), it was first recorded from Nicaragua in 1964 (Davis *et al.*, 1964) and from Costa Rica in 1966 (Carter *et al.*, 1966). The additional specimens here reported were caught in mist nets set either across or parallel to streams, rivers or creeks near the ocean (with estuarine tidal influence at Boca de Barranca). At Hacienda Bonilla, near Boca de Barranca, we watched fish-eating bats, along with *Rhynchonycteris*, coursing over a long rain "puddle" (roughly five by 30 yards in extent) containing minnow-sized fish. *Saccopteryx bilineata*, *Molossus* sp. and seven species of phyllostomatids were taken in various combinations in the same nets with *N. leporinus* at the three localities.

Pteronotus davyi Gray

Pteronotus davyi Gray, 1838, Mag. Zool. Bot., 2: 500.

Chilonycteris gymnotus Wagner, 1843, Arch. Naturgeschichte, 9 (Bd. 1): 367.

Chilonycteris davyi fulvus Thomas, 1892, Ann. Mag. Nat. Hist., ser. 6, 10: 410.

Dermonotus davyi, Miller, 1902, Proc. Biol. Soc. Wash., 15: 155.

Pteronotus davyi davyi, Miller, 1912, Bull. U.S. Nat. Mus., 79: 33.

Pteronotus davyi fulvus, Miller, 1912, Bull. U.S. Nat. Mus., 79: 33.

Specimens: ALAJUELA: 4.6 miles (1067 m) and 8.4 miles (671 m) W bridge at Atenas on road to San Matéo, 1 ♂, 2 ♀♀. GUANACASTE: Playas del Coco, sea level, 1 ♀; 5 miles N Liberia along Interamerican Highway, 150 m, 1 ♀.

Measurements: Averages and ranges (4 females): forearm, 45.7 (44.7-47.6); greatest length of skull, 16.1 (15.8-16.5); condylobasal length, 14.9 (14.7-15.2); length of maxillary tooththrow, C-M³, 6.7 (6.5-6.8); postorbital constriction, 3.7 (3.5-3.8); zygomatic breadth (3 females), 8.9 (8.9-9.0); breadth of braincase, 7.9 (7.7-8.0); mastoid breadth, 8.5 (8.0-8.8); alveolar breadth across upper canines, 4.8 (4.8-4.9); breadth across M³-M³, 6.0 (6.0); length of mandibular tooththrow, C-M₃, 7.1 (7.0-7.1); length of mandible, 12.0 (11.8-12.1).

Remarks: Previous to the collection of the specimens reported here, there has been a gap, which extended from El Salvador (Hall and Kelson, 1959) to Venezuela (Cabrera, 1957), in the distribution of this tropical American species. The northern and Antillean-southern populations were distinguished as subspecies when Thomas (1892) described *P. d. fulvus* from Mexico. Apparently, however, the species essentially is distributed continuously. A comparison of measurements of the specimens from Costa Rica with those of *P. d. fulvus* (including the type) from Mexico (Goodwin, 1946; LACM specimens) and El Salvador (Burt and Stirton, 1961; Felten, 1956a) and *P. d. davyi* from Trinidad (Dobson, 1878; Goodwin, 1946; Goodwin and Greenhall, 1961) indicates that, although some clinal variation may exist, these forms do not warrant taxonomic distinction (as has already been suggested by J. A. Allen, 1894). The status of the *P. davyi* mentioned by Goodwin (1946), from the Island of Dominica, may be open to question.

The specimen of *P. davyi* from Playas del Coco was caught, along with seven species of phyllostomatids and *Desmodus*, in a mist net set over a stream. The other four were all shot over roads at night, the three from the road to San Matéo while they were flying low hunting courses along the roadside vegetation. Also shot with the latter were *Peropteryx macrotis* and *Eptesicus furinalis gaumeri*.

***Pteronotus suapurensis suapurensis* (J. A. Allen)**

Dermonotus suapurensis J. A. Allen, 1904, Bull. Amer. Mus. Nat. Hist., 20: 229.

Pteronotus suapurensis, J. A. Allen, 1911, Bull. Amer. Mus. Nat. Hist., 30: 265.

Pteronotus davyi suapurensis, G. M. Allen, 1935, Jour. Mamm., 16: 227.

Pteronotus suapurensis centralis Goodwin, 1942, Jour. Mamm., 23: 88.

Pteronotus suapurensis suapurensis, Davis, Carter and Pine, 1964, Jour. Mamm., 45: 377.

Specimens: PUNTARENAS: 35 miles SE San Isidro del General along Interamerican Highway, near bridge over Río Ceibo, 320 m, 1 ♂; 2.7 miles NW Villa Neilly, at bridge over Río Nuevo, 55 m, 3 ♂♂, 3 ♀♀.

Measurements: Forearm (averages and ranges, 4 males, 3 females, respectively), 52.7 (51.9-53.6), 50.9 (50.5-52.3); (cranial, first two males, second and third females) greatest length of skull, 18.1, 17.7, 17.9, 16.9; condylobasal length, 16.9, 16.7, 16.7, 16.3; length of maxillary toothrow, C-M³, 7.8, 7.5, 7.5, 7.2; postorbital constriction, 4.4, 4.3, 4.1, 4.4; zygomatic breadth, 10.6, 10.2, 10.1, —; breadth of braincase, 9.0, 8.5, 8.6, 8.5; mastoid breadth, 9.4, 9.4, —, 9.8; alveolar breadth across upper canines, 6.0, 5.7, 5.4, 5.8; breadth across M³-M³, 7.3, 7.0, 6.9, 7.0; length of mandibular toothrow, C-M₃, 8.3, 7.9, 7.9, 7.7; length of mandible, 14.1, 13.6, 13.5, 13.1.

Remarks: This species, which is known from a limited number of localities from Veracruz, Mexico (Davis *et al.*, 1964), through Central America into northern South America (Cabrera, 1957; Hall and Kelson, 1959), has been recorded previously from Costa Rica from Boruca (562 m), Prov. Puntarenas (Carnegie Museum 1613, Sanborn, 1932). The nearest neighboring records are from one locality in Nicaragua (Goodwin, 1942) and six in Panama (Handley, 1966). Our specimens come from two localities which are both within 60 km of Boruca: all were shot over roads at night, the specimen from Río Ceibo with *Peropteryx macrotis* and those from Río Nuevo with *Saccop-teryx bilineata* and *Diclidurus virgo*.

***Chilonycteris psilotis* Dobson**

Chilonycteris psilotis Dobson, 1878, Cat. Chiroptera British Mus., p. 451.

Chilonycteris torrei continentis Sanborn, 1938, Occ. Pap. Mus. Zool., Univ. Mich., No. 373, p. 1.

Specimens: GUANACASTE: 4.4 miles S Liberia, 125 m, 1 ♀. PUNTARENAS: Rincón de Osa, Osa Productos Forestales, Camp Seattle, 35 m, 1 ♀.

Measurements: Forearm 45.4, 47.0; greatest length of skull, —, 15.6; condylobasal length, —, 14.2; length of maxillary toothrow, C-M³, 6.2, 6.2; postorbital constriction, 3.6, 3.5; zygomatic breadth, 8.5, 8.5; breadth of braincase, 7.2, 7.4; mastoid breadth, 8.3, 8.7; alveolar breadth across upper canines, 4.4, 4.4; breadth across M³-M³, 5.6, 5.8.

Remarks: This species, which apparently occurs from tropical Mexico at least to Venezuela (De la Torre, 1955), has been recorded previously in Central America south of El Salvador (Burt and Stirton, 1961) only from localities in Panama (Handley, 1966). Goodwin and Greenhall (1961) consider this small *Chilonycteris* a subspecies of *C. personata* Wagner. However, at this point, without the opportunity to make a fuller study of the necessary comparative material, we are following De la Torre (1955) in considering

C. psilotis Dobson (type locality: Oaxaca, Mexico) specifically distinct from *C. personata* Wagner (type locality: Matto Grosso, Brazil) and assigning the Costa Rican specimens to the former.

We prefer to retain the generic distinction between the "naked-backed" species (*Pteronotus*) and those with the wing membranes attached farther down on the sides of the body (*Chilonycteris*). The distinction is clear and definitive, in spite of the fact that there is some variation in this character among the species of *Chilonycteris*, as pointed out by Burt and Stirton (1961) in their discussion which argued in favor of considering all the species of the two genera as congeneric, under the name *Pteronotus*.

Both LACM specimens were shot over the road at night, the one from Rincón de Osa while it was hunting relatively low over the ground and vegetation next to a small swamp.

***Micronycteris schmidtorum* Sanborn**

Micronycteris schmidtorum Sanborn, 1935, Zool. Ser., Field Mus. Nat. Hist., 20: 81.

Specimens: GUANACASTE: 3 km S Playas del Coco, 70 m, 1 ♂, 5 ♀ ♀; 9 km N Liberia along Interamerican Highway and 4 km E Interamerican Highway, 150 m, 1 ♂.

Measurements: Forearm (2 males, average and range of 5 females, respectively), 33.1, 34.0, 35.1 (34.6-35.9); (cranial, 2 males, third and fifth females) greatest length of skull, 20.4, 19.8, 19.8, 20.0; condylobasal length, 17.1, 17.0, 17.7, 17.5; length of maxillary toothrow, C-M³, 7.7, 7.8, 7.6, 7.8; postorbital constriction, 4.2, 4.3, 4.3, 4.4; zygomatic breadth, 9.3, 9.5, 9.1, 9.4; breadth of braincase, 8.2, 7.9, 7.9, 8.1; mastoid breadth, 9.2, 9.0, 9.0, 8.8; alveolar breadth across upper canines, 3.3, 3.3, 3.4, 3.2; breadth across M³-M³, 6.4, 6.1, 6.2, 6.1; length of mandibular toothrow, C-M₃, 8.2, 8.4, 8.3, 8.3; greatest length of lower premolar series, 3.0, 3.0, 3.1, 3.0.

Remarks: These specimens mark the first Costa Rican records for this bat, which was previously known from four localities from Yucatan, Mexico, to southeastern Nicaragua (Hall and Kelson, 1959; Davis *et al.*, 1964), and one locality in Panama (Handley, 1966). The bats from near Playas del Coco were all taken from one hollow tree (on two successive days); that from near Liberia was captured, along with five other genera of phyllostomatids, in a mist net set across a small stream.

***Macrophyllum macrophyllum* (Schinz)**

Phyllost [oma] macrophyllum Schinz, 1821, Das Thierreich, 1: 163.

Macrophyllum macrophyllum, Nelson, 1912, Proc. Biol. Soc. Wash., 25: 93.

Specimens: GUANACASTE: Río Colorado, 9 km N Liberia along Interamerican Highway and 4 km E Interamerican Highway, 150 m, 5 ♂ ♂ (1 imm.). LIMON: Finca La Lola, Río Madre de Dios, 50 m, 1 ♀.

Measurements: Female, Río Madre de Dios (LACM 15147), male, Río Colorado (LACM 23365), respectively: forearm 35.3, 34.4; greatest length of skull, 16.9, 17.2; condylobasal length, 13.8, 14.2; length of maxillary tooththrow, C-M³, 5.3, 5.6; postorbital constriction, 3.3, 3.2; zygomatic breadth, 9.4, 9.6; mastoid breadth, 8.7, 9.0; alveolar breadth across upper canines, 3.5, 3.4; breadth across M³-M³, 6.4, 6.3; length of mandibular tooththrow, 5.9, 6.0.

Remarks: These specimens appear to be the first records of *Macrophyllum* from Costa Rica. Previous published records for Central America, including localities in Nicaragua and Panama, are discussed by Davis *et al.* (1964), Jones (1964), and Handley (1966).

The female from La Lola was caught early in the evening in a mist net set across the Río Madre de Dios. The five males from the Río Colorado were taken from a diurnal roost in an irrigation tunnel, along with numerous *Carollia* sp. and *Chilonycteris parnellii*.

Trachops cirrhosus (Spix)

Vampyrus cirrhosus Spix, 1823, Simiarum et vespertilionum Brasiliensum. . . ., p. 64.

Trachops fuliginosus Gray, 1865, Proc. Zool. Soc. Lond., p. 14.

Specimens: PUNTARENAS: Boca de Barranca, 5 m, 9 ♂♂, 8 ♀♀; Dominical, 3 m, 5 ♂♂, 5 ♀♀; 5 km N Villa Neilly on Interamerican Highway, 150 m, 1 ♂; Monteverde, Río Guacimal, 1380 m, 1 ♂.

Measurements: Two females, averages and ranges for 4 males, respectively: forearm, 59.7, 61.1, 59.1 (57.3-61.7); greatest length of skull, 28.1, 27.7, 28.5 (28.3-29.1); condylobasal length, —, 24.3, 24.7 (24.6-24.9); length of maxillary tooththrow, C-M³, 9.9, 9.8, 10.1 (10.1-10.2); postorbital constriction, 5.3, 5.2, 5.4 (5.1-5.3); zygomatic breadth, 13.5, 13.6, 13.7 (13.6-13.9); mastoid breadth, 13.0, 13.2, 13.3 (13.1-13.4); alveolar breadth across upper canines, 11.1, 11.1, 11.4 (11.1-11.9); breadth across M³-M³, 9.5, 9.7, 9.8 (9.7-9.9); length of mandibular tooththrow, 10.8, 10.8, 11.0 (10.8-11.2).

Remarks: This species has been reported previously from only one locality in Costa Rica: Río Tenorio, 3 miles S and 10 miles W Las Cañas, 3 m, Prov. Guanacaste (Davis and Carter, 1962). The next closest localities are in Honduras (Goodwin, 1942) and Panama (Handley, 1966). Felten (1956b) considers *Trachops coffini* Goldman to be a subspecies of *T. cirrhosus* and uses the name *T. cirrhosus coffini* for specimens from El Salvador, as do also Burt and Stirton (1961). Handley (1966) lists the *Trachops* from Panama as *T. c. cirrhosus*. Examination of further comparative material will be necessary in order to clarify the subspecies question in this genus and determine which name should be used for specimens from Costa Rica.

The specimens from Boca de Barranca were taken during the day from an abandoned railroad tunnel, on four different dates from July, 1962, to late June, 1963. Those from Dominical and near Villa Neilly were caught in

culverts in daytime. The Monteverde specimen was captured in a mist net set across a narrow stream gorge.

Chrotopterus auritus Peters

Vampyrus auritus Peters, 1856, Abhandl. preuss. Akad. Wiss., Berlin, p. 305.

Chrotopterus auritus, Peters, 1865, Monatsb. preuss. Akad. Wiss., Berlin, p. 505.

Specimens: LIMON: Finca La Lola, 50 m, 7 ♂♂ (1 imm.), 1 ♀.

Measurements: Female, 3 males, respectively: forearm, 83.0, 79.3, 79.7, 79.8; greatest length of skull, 38.5, 36.9, 37.4, 37.9; condylobasal length, 32.9, 31.4, 32.0, 32.4; length of maxillary toothrow, C-M³, 13.9, 13.5, 13.5, 13.8; postorbital constriction, 15.9, 15.7, 16.1, 16.0; zygomatic breadth, 19.5, 18.4, 19.3, 18.9; mastoid breadth, 17.1, 16.6, 16.9, 16.7; alveolar breadth across upper canines, 17.8, 17.2, 17.8, 17.4; breadth across M³-M³, 12.3, 11.5, 12.2, 12.0; length of mandibular toothrow, 15.9, 15.1, 15.6, 15.5.

Remarks: These specimens represent the first Costa Rican records for this species. *Chrotopterus* has been reported previously from Mexico (Hall and Kelson, 1959; Davis *et al.*, 1964), El Salvador (Burt and Stirton, 1961), Guatemala (Carter *et al.*, 1966), Panama (Handley, 1966), and South America (Cabrera, 1957).

The first seven specimens were taken from a diurnal roost in a large hollow tree (July 30, 1961). When the tree was revisited in September, 1962, a large colony of vampires (*Desmodus rotundus*) were occupying the tree and only one male *Chrotopterus* was present.

Vampyrodes major G. M. Allen

Vampyrodes major G. M. Allen, 1908, Bull. Mus. Comp. Zool., 52: 38.

Vampyrodes ornatus Thomas, 1924, Ann. Mag. Nat. Hist., ser. 9, 13: 532.

Vampyrodes caraccioloii ornatus, Cabrera, 1957, Rev. Mus. Argent. Cien. Nat. "Bernardino Rivadavia," Cien. Zool., 4: 82.

Vampyrodes carracioloii major, Carter, Pine and Davis, 1966, Southwest. Nat., 11: 494.

Vampyrodes caraccioloii major, Handley, 1966, p. 766, in Wenzel and Tipton, Ectoparasites of Panama.

Specimens: HEREDIA: Puerto Viejo de Sarapiquí, 100 m, 1 ♂ (KU 88153). LIMON: Finca La Lola, 50 m, 1 ♀; Los Diamantes, 100 m, 3 ♂♂, 7 ♀♀. PUNTARENAS: Rincón de Osa, Osa Productos Forestales, near Río Rincón, 5 m, 1 ♀.

Measurements: (Averages and ranges): forearm (3 males, 9 females), 53.1 (52.2-54.4); (cranial, 3 males, 2 females) greatest length of skull, 27.9 (27.4-28.4); condylobasal length, 24.5 (24.4-24.7); length of maxillary toothrow, C-M², 9.9 (9.8-10.1); postorbital constriction, 6.8 (6.6-7.0); zygomatic breadth, 17.2 (16.7-17.8); breadth of braincase, 12.0 (11.7-12.2);

mastoid breadth, 13.9 (13.7-14.3); alveolar breadth across upper canines, 6.9 (6.8-7.3); breadth across M^2 - M^2 , 12.4 (12.0-12.6).

Remarks: *Vampyrodes major* has been recorded previously in Costa Rica only from Cerro Santa María, Prov. Alajuela (Goldman, 1920). This bat is apparently not uncommon at lower elevations on both coasts, although it seems to prefer the wetter portions of the country. Our specimens were all captured in mist nets.

From a comparison of specimens, published data and the original descriptions of *Vampyrodes major*, *V. ornatus* Thomas, and *V. caracciolae* Thomas, it seems that there is no reason for retaining *V. ornatus* as a species distinct from *V. major* nor, in fact, for even distinguishing the two subspecifically (in agreement with Handley, 1966). The measurements of *V. ornatus*, as well as its salient characters, fit in with those of *V. major* (including the type and LACM series of the latter from Costa Rica and Mexico) and there seems to be no break in these features anywhere in the ranges of localities represented by the two names. *V. caracciolae*, on the other hand, appears to be a distinct, smaller, and less brightly colored species which deserves specific status (contrary to the opinions of Cabrera, 1957, Goodwin and Greenhall, 1961, and Handley, 1966). Two obvious dental characters separate *V. major* from *V. caracciolae*: the former has distinctly bifid and rounded outer upper incisors while in *V. caracciolae* these teeth are entire with a more flattened profile (a character illustrated by Thomas, 1889, and by Goodwin and Greenhall, 1961, but otherwise apparently overlooked); the M_1 of *V. major* has a distinct cusplet arising from the anterolingual portion of the cingulum, whereas this structure is absent in *V. caracciolae*. The small size of the male *Vampyrodes* from Utinga, Pará, Brazil, mentioned by Thomas (1920), suggests that it also belongs to the latter species rather than to *V. major*. Since the specimen from Pará apparently was returned to Brazil, Thomas' inclusion of it in *V. caracciolae* will have to remain as the standing opinion on this matter until the dental characters can be checked. *V. major* is currently known from Peru (San Lorenzo, Depto. Loreto: type locality of *V. ornatus*) and most of the countries in Middle American from Panama to Mexico (summarized by Davis *et al.*, 1964, and Handley, 1966), and has a distribution quite separate from that of *V. caracciolae*. Further collecting in the intermediate areas in South America may bring the two ranges closer together.

***Ectophylla alba* H. Allen**

Ectophylla alba H. Allen, 1892, Proc. U.S. Nat. Mus., 15: 441.

Specimens: CARTAGO: Turrialba, Instituto Interamericano de Ciencias Agrícolas, 602 m, 1 ♂ (ISU 230), 1 (?) (IICA). HEREDIA: Finca "La Selva," near Puerto Viejo de Sarapiquí, 100 m, 2 ♀ ♀.

Measurements: Forearm (male, 2 females), 28.1 (dry), 28.6, 29.5; (cranial, male) greatest length of skull, 17.0; condylobasal length, 15.8; length of maxillary toothrow, C- M^2 , 6.1; zygomatic breadth, 10.6; breadth of brain-

case, 6.2; mastoid breadth, 8.8; alveolar breadth across upper canines, 4.3; breadth across M^2 - M^2 , 7.6; length of mandibular tooththrow, C- M_2 , 6.6.

Remarks: The Turrialba specimens represent the third locality for the little white bat in Costa Rica, extending its range some 65 km to the South-southeast from Finca "La Selva" from which three specimens have previously been reported (Casebeer *et al.*, 1963: see also for a summary and discussion of earlier records). This species is known only from the Caribbean lowlands of Nicaragua, Costa Rica and Panama (Handley, 1966), ranging from an unknown elevation (undoubtedly well below 300 m) at the type locality on the Río Coco (Río Segovia), Nicaragua, to approximately 602 m at Turrialba and 732 m in Panama (Handley, 1966). All specimens of this bat were caught in mist nets.

Mesophylla macconnelli Thomas

Mesophylla macconnelli Thomas, 1901, Ann. Mag. Nat. Hist., ser. 7, 8: 143.

Ectophylla macconnelli, Laurie, 1955, Ann. Mag. Nat. Hist., ser. 12, 8: 269.

E[ctophylla] m[acconnelli] macconnelli, Goodwin and Greenhall, 1962, Amer. Mus. Nov., no. 2080, p. 3.

Ectophylla macconnelli flavescens Goodwin and Greenhall, 1962, Amer. Mus. Nov., no. 2080, p. 2.

Ectophylla macconnelli, Handley, 1966, p. 768, in Wenzel and Tipton, Ectoparasites of Panama.

Specimens: CARTAGO: Moravia de Chirripó, 1116 m, 1 ♀ (UMMZ 111724).

Measurements: Forearm, 33.0; greatest length of skull, 18.5; condylobasal length, 16.7; length of maxillary tooththrow, C- M^2 , 6.3; postorbital constriction, 4.5; zygomatic breadth, 10.4; breadth of braincase, 8.1; mastoid breadth, 9.2; alveolar breadth across upper canines, 4.4; breadth across M^2 - M^2 , 7.7; length of mandibular tooththrow, 7.1.

Remarks: This bat has been reported previously from several localities in Panama, widespread localities in tropical South America, and from Trinidad (Handley, 1966; Cabrera, 1957; Goodwin and Greenhall, 1962). The specimen from Costa Rica is much grayer in color than LACM specimens of *M. macconnelli* from Peru and Brazil, and is apparently even grayer than *M. m. flavescens* (Goodwin and Greenhall) from Trinidad. Its measurements are generally larger than those of *M. m. macconnelli* listed by Goodwin and Greenhall (1962) and approach those of *M. m. flavescens*. Handley (1966) considers the species to be monotypic, on the basis of variability in Panamanian specimens, and we follow Handley's judgment in this matter at this time.

We disagree with Laurie (1955) and Goodwin and Greenhall (1962), and consider *Mesophylla* Thomas to be a genus distinct from *Ectophylla* H. Allen in several prominent cranial, as well as dental, features. The genera *Ectophylla*, *Mesophylla* and *Vampyressa* Thomas form a well-defined group

within the Stenoderminae, sharing cranial, dental and external characters, and showing varying degrees of modification of a similar dentitional pattern. The skull of *Vampyressa pusilla thyone* shows more similarity to that of *Mesophylla* than does the skull of *Ectophylla*, and exhibits dental features seen in both the other genera. *Ectophylla*, with its shortened rostrum, raised nasals, and exaggerated circular and flattened last lower molar (M_2), appears to be the most highly modified of the three genera, and we see no justification for making it congeneric with *Mesophylla*.

***Natalus stramineus mexicanus* Miller**

Natalus mexicanus Miller, Proc. Acad. Nat. Sci. Philadelphia, 54: 399.

Natalus mexicanus mexicanus, Dalquest and Hall, 1949, Proc. Biol. Soc. Wash., 62: 153.

Natalus mexicanus saturatus Dalquest and Hall, 1949, Proc. Biol. Soc. Wash., 62: 153.

Natalus stramineus saturatus, Goodwin, 1959, Amer. Mus. Nov., no. 1977, p. 7.

Natalus stramineus mexicanus, Handley, 1966, p. 770, in Wenzel and Tipton, Ectoparasites of Panama.

Specimens: GUANACASTE: Curiol de Santa Rosa, 25 m, 3 ♂ ♂.

Measurements: Forearm, 36.9, 36.4, 36.4; (cranial, second specimen) greatest length of skull, 16.4; condylobasal length, 15.0; length of maxillary toothrow, C-M³, 6.9; postorbital constriction, 3.1; zygomatic breadth, 8.4; breadth of braincase, 7.8; alveolar breadth across upper canines, 3.6; breadth across M³-M³, 5.5.

Remarks: These specimens mark the first records for this genus in Costa Rica. The species (following Cabrera, 1957, and Goodwin, 1959) ranges from tropical Mexico into eastern South America (to Brazil), but until now it has not been recorded from any country between El Salvador and Panama (Hall and Kelson, 1959; Handley, 1966).

The *Natalus* from Costa Rica were caught during the day, in a mist net stretched across the entrance to an abandoned tungsten mine, as they attempted to escape capture in the mine tunnel. Also taken in the same tunnel were *Saccopteryx bilineata* (near the entrance to a small side opening), *Chilonycteris parnellii*, *Carollia subrufa*, *Glossophaga soricina*, and *Desmodus*.

***Myotis simus riparius* Handley**

Myotis simus riparius Handley, 1960, Proc. U.S. Nat. Mus., 112: 466.

Specimen: CARTAGO: 4 km SW Moravia de Chirripó, 1200 m, 1 ♀ (KU 88207).

Measurements: Forearm, 40.4; greatest length of skull, 14.8; condylobasal length, 13.8; length of maxillary toothrow, C-M³, 5.7; postorbital constriction, 3.5; zygomatic breadth, 8.9; breadth of braincase, 6.7; alveolar breadth across upper canines, 3.7; breadth across M³-M³, 5.8.

Remarks: This specimen marks the first record of *Myotis simus* for Costa Rica and extends the range of the subspecies into Central America from eastern Panama (Handley, 1966). This same specimen was recently reported as *Myotis albescens* by Nelson (1965).

***Myotis chiloensis* (Waterhouse)**

Vespertilio chiloënsis Waterhouse, 1838, Zool. Voy. Beagle, p. 5, pl. 3.

Myotis chiloënsis, Cabrera, 1903, Rev. Chilena Hist. Nat., 7: 295.

Specimen: SAN JOSE: Cerro de la Muerte, on Interamerican Highway, 4.3 miles S restaurant "La Georgina," 2590 m, 1 ♂ (LACM 25445).

Measurements: Forearm, 39.5; greatest length of skull, 14.4; condylobasal length, 13.4; length of maxillary toothrow, C-M³, 5.5; postorbital constriction, 3.9; zygomatic breadth, 8.7; breadth of braincase, 6.9; alveolar breadth across upper canines, 3.6; breadth across M³-M³, 5.7.

Remarks: This species is here recorded for the first time north of Panama (Handley, 1966). The bat was shot at night while it was hawking insects over the highway.

This specimen is listed without subspecific designation due to the lack of a sufficiently large series for proper comparison with South American forms (see further Handley, 1966).

***Eptesicus furinalis gaumeri* (J. A. Allen)**

Adelonycteris gaumeri J. A. Allen, 1897, Bull. Amer. Mus. Nat. Hist., 9: 231.

Eptesicus albigularis, Goodwin, 1942, Amer. Mus. Novitates, No. 1199, p. 1 (not *Vesperus* (*Marsipolaemus*) *albigularis* Peters, 1872).

Eptesicus brasiliensis propinquus, Dalquest, 1953, Louisiana State Univ., Bio.

Sci. Ser., 1: 55 (not *Vesperus propinquus* Peters, 1872).

Eptesicus gaumeri gaumeri, Davis, 1965, Jour. Mamm., 46: 233.

Eptesicus furinalis gaumeri, Davis, 1966, Southwest. Nat., 11: 268.

Specimens: ALAJUELA: 8.4 miles from bridge at Atenas on road to San Matéo, 671 m, 1 ♂. LIMON: Finca La Lola, 50 m, 1 ♂; Tortuguero, sea level, 1 ♂ (UF 8025). PUNTARENAS: Boca de Barranca, sea level, 2 ♂ ♂, 3 ♀ ♀.

Measurements: (Averages and ranges): forearm (5 males, 3 females), 38.8 (37.8-39.6); (cranial, 3 males, 3 females) greatest length of skull, 15.7 (15.6-15.9); condylobasal length, 14.4 (14.1-14.8); length of maxillary toothrow, C-M³, 5.6 (5.3-5.9); postorbital constriction, 3.8 (3.6-3.9); zygomatic breadth (2 males, one female, this measurement only), 10.5 (10.4-10.6); breadth of braincase, 7.3 (7.1-7.5); mastoid breadth, 8.2 (8.0-8.4); alveolar breadth across upper canines, 4.6 (4.4-4.9); breadth across M³-M³, 6.5 (6.3-6.6).

Remarks: Davis (1966) gives the range of this subspecies essentially as lowland Middle America and Caribbean South America, from Mexico to Surinam, and lists specimens (Davis, 1965) from every Middle American

country except Belize and Costa Rica. The records reported here serve to fill in the distribution of this bat on both lowlands of Costa Rica.

The specimens from Boca de Barranca were caught in mist nets set along the edge of a creek, along with *Rhynchonycteris*, *Rhogeessa tumida*, *Molossus* sp. and several species of phyllostomatids; the one from the road to San Mateo was shot over the road at night not far from the locality at which *Peropteryx macrotis* and *Pteronotus davyi* were collected. The flight of *E. f. gaumeri* is quite similar to that of *Myotis nigricans*.

***Eptesicus andinus* J. A. Allen**

Eptesicus andinus J. A. Allen, 1914, Bull. Amer. Mus. Nat. Hist., 33: 382.

Eptesicus chiriquinus Thomas, 1920, Ann. Mag. Nat. Hist., ser. 9, 5: 362.

Eptesicus brasiliensis andinus, Hershkovitz, 1949, Proc. U.S. Nat. Mus., 99: 451.

Eptesicus andinus andinus, Davis, 1965, Jour. Mamm., 46: 239.

Eptesicus andinus, Davis, 1966, Southwest. Nat., 11: 252.

Specimens: SAN JOSE: San José, campus Universidad de Costa Rica, 1200 m, 1 ♀; Candelaria, elevation uncertain, 1 ♀ (MCZ 20445); Cerro de la Muerte, S restaurant "La Georgina" along Interamerican Highway, 4.2 miles, 2743 m, 2 ♂♂, 6.0 miles, 2590 m, 1 ♂, 6.8 miles, 2500 m, 2 ♂♂, and 17.5 miles, 1525 m, 1 ♂; San Isidro del General, 705 m, 1 ♀.

Measurements: (Averages and ranges) forearm (5 males, 3 females), 44.2 (42.8-46.4); greatest length of skull (6 specimens), 17.0 (16.7-17.3); condylobasal length (8), 16.0 (15.5-16.4); length of maxillary toothrow, C-M³ (8), 6.2 (5.9-6.5); postorbital constriction (8), 4.1 (3.8-4.5); zygomatic breadth (7), 11.2 (10.9-11.6); breadth of braincase (7), 7.8 (7.7-8.1); mastoid breadth (7), 8.9 (8.4-9.2); alveolar breadth across upper canines (8), 5.0 (4.8-5.3); breadth across M³-M³ (8), 7.9 (6.9-7.3).

Remarks: The LACM specimens have been cited by Davis in his review of South American *Eptesicus* (1966); the one from Candelaria (MCZ) represents a new record. Only one locality north of Costa Rica is reported, based on one specimen from Chiapas, Mexico (Davis, 1966).

The animals from Cerro de la Muerte were all shot over the highway at night; that from San José (previously reported as *E. chiriquinus* by Tamsitt and Valdivieso, 1961) was taken in a mist net set across a small stream. Also captured in the same net with the latter specimen were *Eptesicus fuscus miradorensis*, *Myotis nigricans*, and several species of phyllostomatids. The *E. andinus* from Candelaria was part of a series of bats collected by C. F. Underwood, presumably all from the same locality, which included also an adult male *E. fuscus miradorensis* and a number of subadults and juveniles of the latter species.

***Rhogeessa tumida tumida* H. Allen**

R. [hogeessa] tumida H. Allen, 1866, Proc. Acad. Nat. Sci. Phila, 18: 285.

Rhogeessa parvula tumida, Hall, 1952, Univ. Kans. Publ., Mus. Nat. Hist., 5: 231.

Rhogeessa tumida tumida, Goodwin, 1958, Amer. Mus. Nov., No. 1923: 3.

Specimens: GUANACASTE: Sámará, sea level, 2 ♀ ♀; PUNTARENAS: Boca de Barranca, sea level, 1 ♂; Hacienda Bonilla (near Boca de Barranca), sea level, 1 ♀.

Measurements: Forearm (male, 3 females, respectively), 29.2, 29.2, 29.3, 29.4; (cranial, male, first 2 females) greatest length of skull, 12.7, 12.8, 12.5; condylobasal length, 11.6, 11.4, 11.6; length of maxillary tooththrow, C-M³, 4.4, 4.4, 4.4; postorbital constriction, 3.2, 3.4, 3.1; zygomatic breadth, —, 8.1, —; breadth of braincase, 5.9, 6.0, 5.8; mastoid breadth, 6.7, 6.8, 6.8; alveolar breadth across upper canines, 3.7, 3.6, 3.6; breadth across M³-M³, 5.2, 5.4, 5.3.

Remarks: This tiny bat is known from Costa Rica from Miravalles, Prov. Guanacaste, (Sanborn, 1932), and "Pacific Coast" (Goodwin, 1946), in addition to the two localities recorded here. It has been taken in most countries of Central America (Goodwin, 1958; Handley, 1966). Our specimens are in agreement with the description and measurements of *R. t. tumida* published by Goodwin (1958). All four were caught in mist nets in association with several species of phyllostomatids.

***Lasiurus ega panamensis* (Thomas)**

Dasypterus ega panamensis Thomas, 1901, Ann. Mag. Nat. Hist., ser. 7, 8: 246.

Lasiurus ega panamensis, Handley, 1960, Proc. U.S. Nat. Mus., 112: 474.

Specimens: PUNTARENAS: Interamerican Highway, near bridge over Río Puerto Nuevo, 90 m, 1 ♀, and near bridge over Río Catarata, 180 m, 1 ♂.

Measurements: (Male, female, respectively) forearm, 44.5, 45.9; greatest length of skull, 15.8, 16.2; condylobasal length, 14.5, 15.4; length of maxillary tooththrow, C-M³, 5.5, 5.6; postorbital constriction, 4.6, 4.4; zygomatic breadth, 10.3, 10.8; breadth of braincase, 8.4, 8.2; alveolar breadth across upper canines, 5.9, 6.0; breadth across M³-M³, 7.1, 7.4.

Remarks: The yellow bat is poorly represented from Central America. Only two specimens, both males, have been reported from Costa Rica, one from San José, Prov. San José, and the second from "Lajas Villa Quesada," Prov. Alajuela (Goodwin, 1946). The two individuals recorded here were both shot at night over the road, where they passed as they flew hunting patterns along the edge of the gorge of the Río Térraba. These bats were extremely rapid and maneuverable and they made considerable effort to stay out of our lights. In two nights of shooting at a fair number of yellow bats we were able to secure only these two specimens.

ACKNOWLEDGMENTS

The specimens recorded in this paper were collected mainly by various field parties working with the support of grant funds (field years and principal

investigators): National Academy of Sciences, Bache Fund, no. 465 (1961—Starrett); National Science Foundation, no. G-18002 (1961—Starrett) and no. G-6089 (1959—J. M. Savage and Starrett); U.S. Army Medical Research and Development Command, nos. DA-MD-49-183-62-G54 and DA-MD-49-193-63-G94 (1962-1964—F. S. Truxal and C. A. McLaughlin, Jr.). These field parties included, in addition to the authors, respectively, Ronald B. Linsky; Arden H. Brame, Arnold G. Kluge, Robert J. Lavenberg; the late Jorge Pérez; Harry N. Coulombe, Charles L. Hogue, Anthony G. Hollister, Julius E. Geest, David Marqua, Charles A. McLaughlin, Jr., Allan A. Schoenherr, Robert Stephens and Fred S. Truxal. Others who have contributed field time and/or specimens include Keith Arnold, Edgar Arrieta, William A. Bussing, John V. Dennis, Jorge Hernández-Camacho, Roy W. McDiarmid, Jay M. Savage, Norman J. Scott, James R. Tamsitt, Fred G. Thompson, Darío Valdivieso, James L. Vial and Alvaro Wille.

Leslie R. Holdridge and Robert J. Hunter generously allowed members of various parties to use facilities and collect specimens on their fincas "La Selva," near Puerto Viejo de Sarapiquí. Similar courtesies and assistance have also been extended by Albert Wright, director, Walt Strain, foreman, and Gus Zambrano, at Osa Productos Forestales, Rincón de Osa; Don Alfredo Paredes, Finca La Lola; Gerardo Budowski, Instituto Interamericano de Ciencias Agrícolas, Turrialba (IICA); Rex Benson, Gromaco Foundation; William and Daryl Cole, Quaker Colony, Monteverde; the various members of the staff at Los Diamantes experimental station; and Milton Lopez, Ministerio de Salubridad Pública. John de Abate and Rafael L. Rodríguez, Universidad de Costa Rica, on many occasions gave of their time to provide advice and help.

Loans of specimens, permission to publish records, and courtesies during visits to various museums were extended by Dale E. Birkenholz, Illinois State University, Normal (ISU); John H. Kaufmann, University of Florida (UF); William B. Davis and Dillard C. Carter, Texas A. and M. University (TCWC); Barbara Lawrence and Charles W. Mack, Museum of Comparative Zoology, Harvard (MCZ); William H. Burt and Emmet T. Hooper, Museum of Zoology, University of Michigan (UMMZ); E. Raymond Hall and J. Knox Jones, Jr., Museum of Natural History, University of Kansas (KU); Richard G. Van Gelder, American Museum of Natural History; Joseph C. Moore, Field Museum of Natural History, Chicago; Charles O. Handley, Jr., U.S. National Museum; J. Kenneth Doutt, Carnegie Museum.

It is a pleasure to acknowledge the time and assistance provided by all of these people and institutions, as well as others whose names may have been omitted inadvertently. So many people have contributed in one way or another, particularly in Costa Rica, that it is not possible to provide a complete list. Nonetheless, we do here express our appreciation to all.

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Accepted for publication April 3, 1968